

Amendments to the Claims:

1      1. (Deleted).

1      2. (Currently Amended) The mass analyzer of claim 45, wherein the electron filament is  
2                configured to generate electrons when heated in an electric field of less than 70  
3                volts per centimeter.

1      3. (Currently Amended) The mass analyzer of claim 45, wherein the electron filament is  
2                configured to generate electrons when heated in an electric field of less than 50  
3                volts per centimeter.

1      4. (Currently Amended) The mass analyzer of claim 45, wherein the electron filament is  
2                configured to generate electrons while a background pressure in the source is  
3                greater than  $1.0 \times 10^{-4}$  Torr.

1      5. (Currently Amended) A mass analyzer comprising an electron source, the electron  
2                source including:  
3                an electron filament coupled to an electrical supply, the electron filament  
4                including a conductive wire or conductive ribbon, the electron filament  
5                configured to generate electrons when heated and configured to generate  
6                electrons while a background pressure in the source is greater than  $1.0 \times$   
7                 $10^{-5}$  Torr;  
8                a plurality of nanofilaments disposed on the surface of the electron filament; and

9           a filament body for positioning the electron filament relative to a mass filter~~The~~  
10          mass analyzer of claim 1, wherein the electron filament is configured to  
11          generate electrons while a background pressure in the source is greater  
12          than  $1.0 \times 10^{-5}$  Torr.

1       6. (Deleted)

1       7. (Currently Amended) A mass analyzer comprising an electron source, the electron  
2        source including:  
3        an electron filament coupled to an electrical supply configured to pass a current  
4        through the electron filament;  
5        a plurality of nanofilaments disposed on the surface of the electron filament;  
6        a filament body for positioning the electron filament relative to a mass filter; and  
7        a magnetic field configured for directing electrons generated using the electron  
8        filament. The mass analyzer of claim 6, wherein the means for directing  
9        electrons is a magnetic field.

1       8. (Currently Amended) A mass analyzer comprising an electron source, the electron  
2        source including:  
3        an electron filament coupled to an electrical supply configured to pass a current  
4        through the electron filament;  
5        a plurality of nanofilaments disposed on the surface of the electron filament;  
6        a filament body for positioning the electron filament relative to a mass filter; and  
7        means for directing electrons generated using the electron filament;

8 | The mass analyzer of claim 6, wherein the electron source is configured such that  
9 | the directed electrons are accelerated to an energy of approximately 70  
10 | electron volts.

1 9. (Currently Amended) The mass analyzer of claim 67, wherein the nanofilaments  
2 include carbon nanotubes.

1 10. (Currently Amended) The mass analyzer of claim 68, wherein the nanofilaments  
2 include boron.

1 11. (Currently Amended) The mass analyze of claim 67, wherein the electron  
2 source is configured to generate electrons for electron capture ionization.

1 12. (Currently Amended) The mass analyzer of claim 68, wherein the electron source is  
2 configured to generate electrons for electron impact ionization.

1 13. (Currently Amended) The mass analyzer of claim 67, wherein the electron source is  
2 configured to generate electrons for chemical ionization.

1 14. (Currently Amended) The mass analyzer of claim 67, wherein the electron source is  
2 configured to generate electrons for ion fragmentation.

1 15. (Currently Amended) The mass analyzer of claim 68, wherein the electron filament is  
2 a ribbon or wire.

16. (Currently Amended) The mass analyzer of claim 67, further including a mass filter

1       17. (Currently Amended) The mass analyzer of claim 6~~8~~, further including a sample  
2                          source.

1       18. (Deleted).

1       19. (Currently Amended) The filament assembly of claim 18~~20~~, wherein the electron  
2                          filament is a wire or a ribbon.

1       20. (Currently Amended) A filament assembly comprising:  
2                          an electron filament coupled to an electrical supply configured to provide a  
3                          current through the electron filament and to hold the electron filament at a  
4                          potential of approximately 70 Volts relative to part of an electron source;  
5                          a plurality of nanofilaments disposed on the surface of the electron filament; and  
6                          means for positioning the electron filament. ~~The filament assembly of claim 18,~~  
7                          wherein the potential is approximately 70 Volts..

1       21. (Original) An analysis system comprising:  
2                          an electron filament coupled to an electrical supply configured to pass a current  
3                          through the electron filament and to hold the electron filament at a  
4                          potential of approximately 70 Volts relative to an other part of the analysis  
5                          system, the electron filament including a conductive wire or conductive  
6                          ribbon, the electron filament configured to generate electrons when  
7                          heated;  
8                          a plurality of nanofilaments disposed on the surface of the electron filament;

9           a filament body for positioning the electron filament relative to the other part of  
10           the analysis system;  
11           means for directing electrons generated using the electron filament;  
12           a mass filter configured to filter ions generated using the generated electrons; and  
13           an ion detector configured to detect the filtered ions.

1       22. (Original) The analysis system of claim 21, further including a chromatograph  
2           configured to introduce a sample to the mass filter.

1       23. (Original) The analysis system of claim 21, further including a second mass filter  
2           configured to introduce a sample to the mass filter configured to filter ions  
3           generated using the generated electrons.

1       24. (Original) A method of analyzing a sample comprising:  
2           generating electrons with energy of approximately 70eV, using an electron  
3           filament coupled to an electrical supply configured to pass a current  
4           through the electron filament and to hold the electron filament at an  
5           approximate potential, the electron filament including a conductive wire or  
6           conductive ribbon, the electron filament further including a plurality of  
7           nanofilaments disposed on the surface of the electron filament;  
8           causing the generated electrons to contact the sample;  
9           ionizing the sample using the generated electrons, to produce ions;  
10          separating the produced ions; and  
11          detecting the separated ions.

1      25. (Currently Amended) The method of claim 24, wherein the separation-separated ions  
2                  are separated in time.

1      26. (Original) The method of claim 24, wherein the produced ions are produced using  
2                  chemical ionization.

1      27. (Original) The method of claim 24, further including maintaining a background  
2                  pressure greater than  $1 \times 10^{-5}$  Torr.

1      28. (Deleted)

1      29. (Currently Amended) The method of claim 2830, further including generating the ion  
2                  using a mass filter.

1      30. (Currently Amended) A method of analyzing a sample comprising:  
2                  generating electrons using an electron filament coupled to an electrical supply  
3                  configured to pass a current through the electron filament and to hold the  
4                  electron filament at an approximate potential, the electron filament  
5                  including a conductive wire or conductive ribbon, the electron filament  
6                  further including a plurality of nanofilaments disposed on the surface of  
7                  the electron filament;

8                  causing the generated electrons to contact an ion in a region with a background  
9                  pressure of greater than  $1 \times 10^{-4}$  Torr;

10                fragmenting the ion using the generated electrons, to produce an ion fragment;  
11                filtering the produced ion fragment; and

12           detecting the filtered ion fragment. The method of claim 28, wherein the generated  
13           electrons are caused to contact the ion in a region with a background  
14           pressure of greater than  $1 \times 10^{-4}$  Torr.

1       31. (Original) A filament assembly comprising:  
2           an electron filament configured to be coupled to an electrical supply for providing  
3           a current through the electron filament and for holding the electron  
4           filament at a potential relative to part of an electron source; and  
5           a plurality of nanoparticles disposed within the electron filament.

1       32. (Original) The filament assembly of claim 31, wherein the nanoparticles are  
2           configured to modify grain boundaries within the electron filament.

1       33. (Original) The filament assembly of claim 31, wherein the nanoparticles include  
2           polyhederal oligomeric silsesquioxane.

1       34. (Currently Amended) The filament assembly of claim 31, wherein the nanoparticles  
2           include a silicon compound of the chemical composition shown in FIG. 7  
3           Si<sub>8</sub>O<sub>8</sub>R<sub>8</sub>.

1       35. (Deleted).

1       36. (Original) The filament assembly of claim 31, further including means for  
2           positioning the electron filament relative to a mass filter.

1       37. (Original) The filament assembly of claim 31, wherein the potential relative to part  
2                   of an electron source is approximately 70 Volts.

1       38. (Original) The filament assembly of claim 31, further including means for  
2                   positioning the electron filament relative to an electron gun.

1       39. (New) The mass analyzer of claim 8, further including a mass filter.

1       40. (New) The mass analyzer of claim 8, wherein the nanofilaments include carbon  
2                   nanotubes.

1       41. (New) The mass analyzer of claim 7, wherein the electron source is configured to  
2                   generate electrons for electron impact ionization.